Dredging Operations Environmental Research (DOER) and Dredging Operations Technical Support (DOTS)

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Basis for DOER

- Pressure to end aquatic placement is ongoing
- Costs of project maintenance and placement alternatives are increasing
- Environmental standards for all alternatives are becoming more restrictive
- Future engineering and environmental innovation will be essential to keep costs within budget constraints

Basis for DOER

- Risk-based assessment and management has become accepted basis for decision-making
- Corporate technology base must be maintained
- Beneficial use of dredged material is a priority
- Technology innovation and enhancement will be a key to success
- Technology transfer and application to stakeholders must be effective

DOER

Objective: Ensure a successful navigation program by resolving complex economic, engineering, and environmental challenges through advancing the science and engineering applied to navigation dredging operations

DOER
- Focus Areas -

- Innovative Technologies
- Environmental Resource Protection
- Dredged Material Management
- Risk

(Finite term work units, e.g. 1-3 years in length, structured by ERDC and Field Review Groups and approved by HDQ USACE to meet program goals)

DOER Innovative Technologies

Identify, evaluate and develop tools, databases
and software, equipment, and techniques to improve the design, operation, and management
of Corps-maintained navigation projects

Work Units

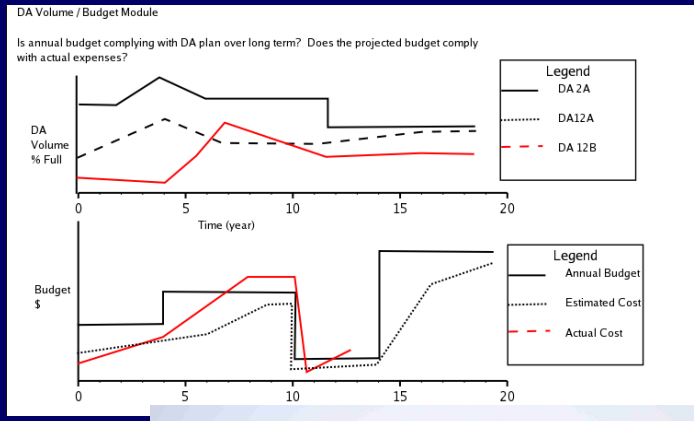
- Evaluations and Cooperative Demonstration
- Dredging Project Management
- Dredging (Operations) Decision Support System

Innovative Technologies Top Five Products for FY05

- Contract payment by hopper measure demos
- Fluid mud survey systems' evaluations
- Mechanical Dredge SI Demo
- TN – Web Services for SI data; standard methods for SI implementation
- TN - DODSS project implementation

Innovative Technologies Top Five Products for FY06

- Updated SI specs and mechanism for Corps-wide implementation
- SI for pipeline dredge demo
- Decision support application for Savannah King Island Turning Basin
- Evaluations on fluid mud survey systems
- Guidance on dredging in unexploded ordnance-contaminated sediment



DOER
Environmental Resource Protection

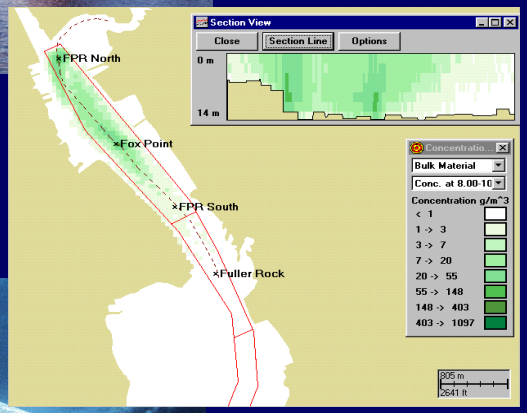
Address challenges associated environmental resource issues using a combination of innovative engineering and science

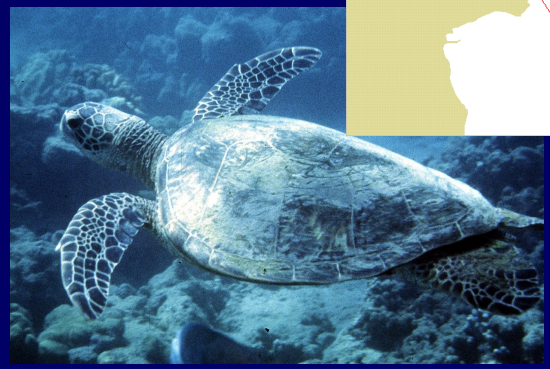
Work Units

- Threatened and Endangered Species Protection
- Habitat Protection
- Environmental Windows

Environmental Resource Protection
Top Five Products for FY05

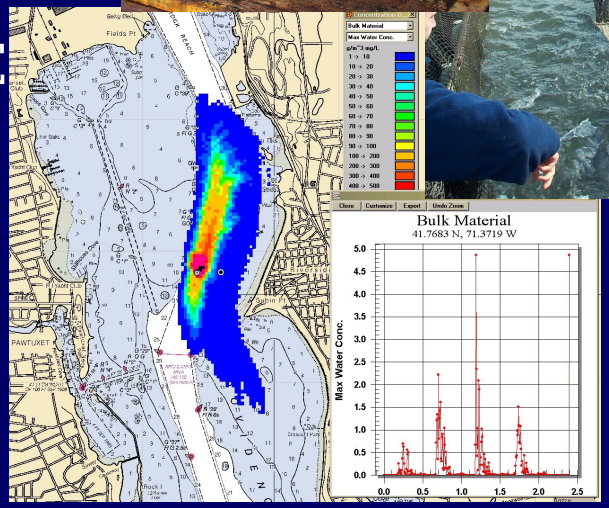
- Collaborative studies with Great Lakes Dredging Team and SF LTMS interagency teams
- Model tool validations
- Address technical issues related to dredging effects on seagrasses and SAV
- Continue sturgeon, shad, tern and piping plover studies
- Expansion of T&E species protection management system





Environmental Resource Protection
Top Five Products for FY 06

- Continue collaborative studies with Great Lakes Dredging Team, SF LTMS, and Providence River interagency teams
- Deploy on-line T&E species protection management system
- Publish validation of SSFATE far-field plume model
- Complete assessments of dredging effects on seagrasses and SAV
- New guidance on effective T&E bird protection measures



DOER

Dredged Material Management

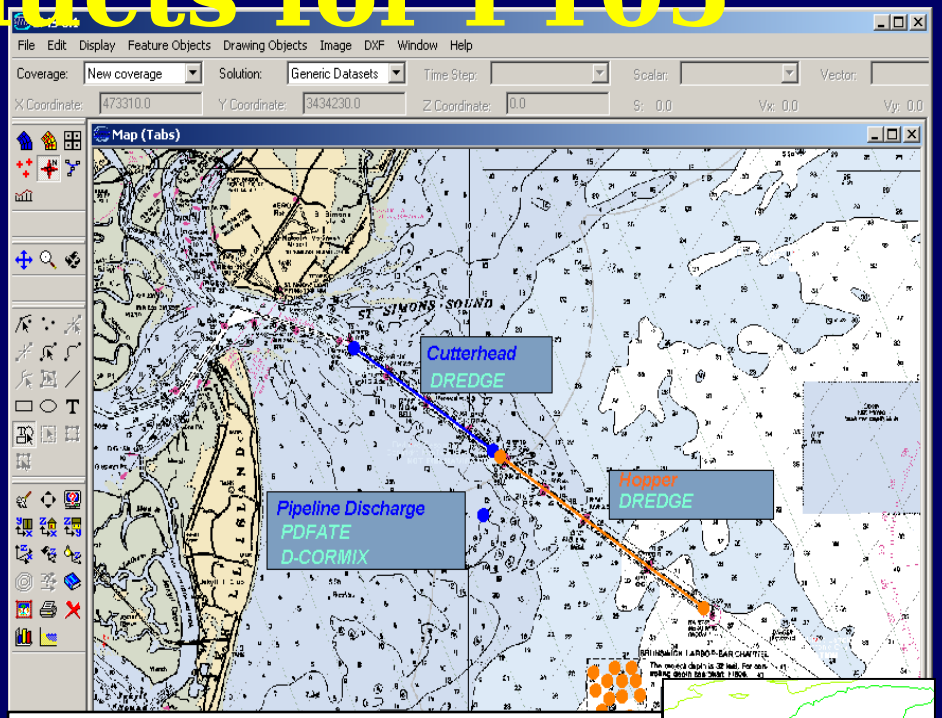
To develop dredged material handling, transport, and placement options which are operationally efficient, environmentally sound, and cost-effective

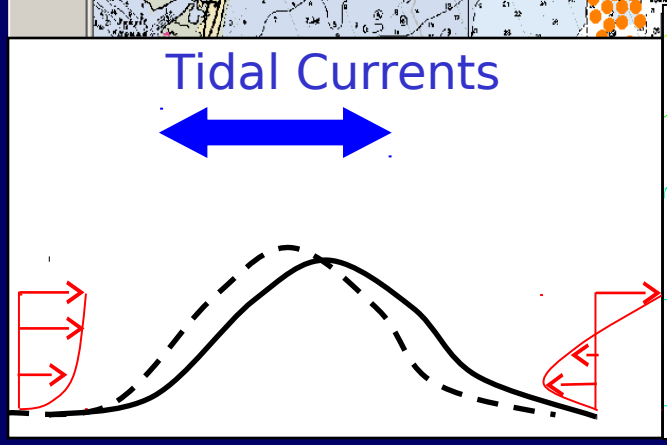
Work Units

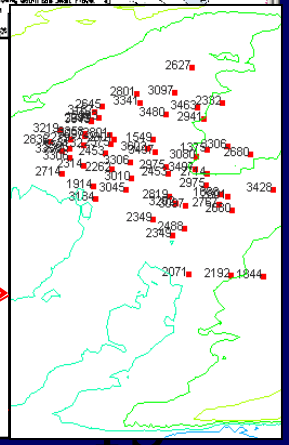
- Dredging Model, Data, and Project Interfaces
- Dredging and Aquatic Placement Operations and Management
- Confined Disposal Facility Placement,

Dredged Material Management
Top Five Products for FY05

- Version 2.0 of SMS dredging tools
- Protocols for monitoring dredging operations
- Monitoring nearshore placement at Savannah
- Upgrade MDFATE, DCORMIX and PDFATE
- Connect SMS dredging toolbox and eCoastal

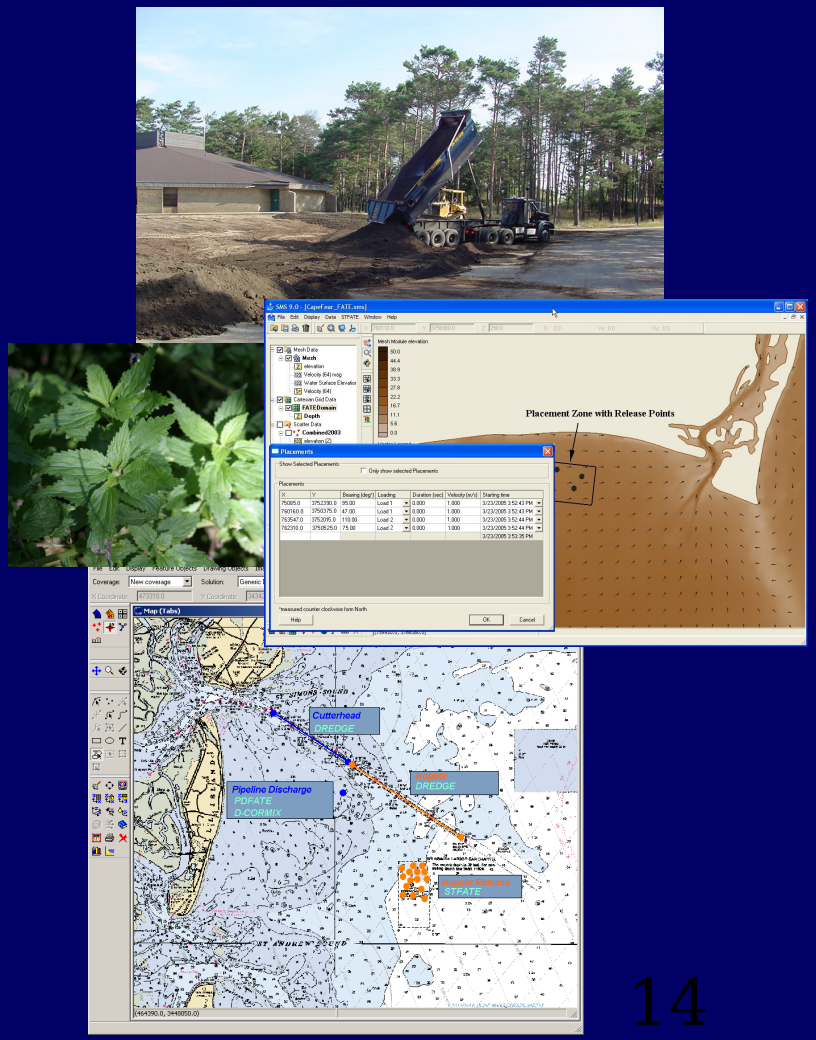






Dredged Material Management Top Five Products for FY06

- **PTM: Three-dimensional particle tracking model for dredge-induced suspended solids**
- **SMS Version 2 for near- and far-field dredging FATE models**
- **Mobile SEAWOLF flume for sediment suspension in wave-current environments**
- **Assessment tools for dredged material beneficial use suitability**
- **Guidance for improved phyto-engineering using soil amendments**



DOER

Risk

Develop and apply a comparative risk-based approach to the assessment and management of dredged material and develop logical decision support tools to manage uncertainty and facilitate efficient decision-making

Work Units

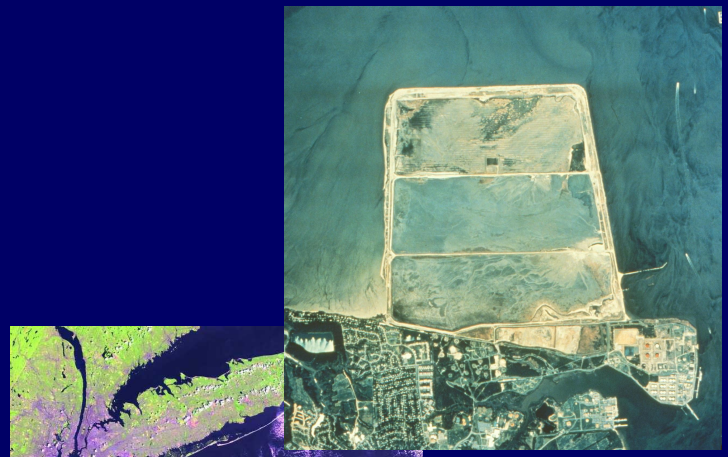
- Exposure Assessment Methods and Approaches
- Effects Assessment Procedures and Tools
- Risk Characterization Approaches and Methods Development
- Risk Management in the Dredging Program

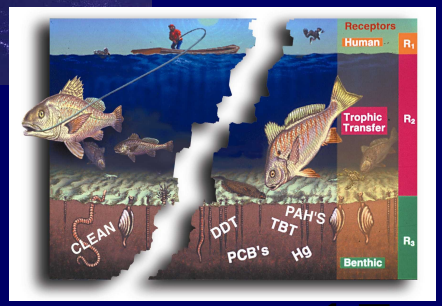
Risk
Top Five Products for FY05

- Field and laboratory validation of chronic sublethal toxicity tests
- Micro-analytical methods for contaminant tissue analysis
- Guidance for costing contaminated sediment management technologies
- Improved capping design models and guidance

Risk
Top Five Products for FY06

- Quantitative screening procedures for CDF contaminant pathway evaluations
- Volatile emissions assessment and modeling guidance
- FishRand-Migration bioaccumulation modeling software
- Framework for applying multi-criteria decision analysis in dredged material management

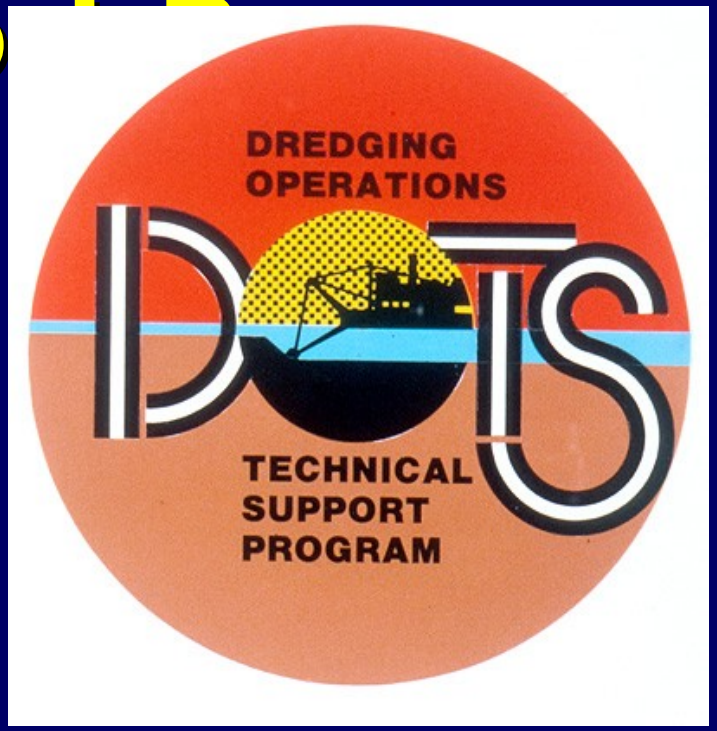




DOER Benefits

- Maintain viable aquatic placement alternatives
- Minimize risk to biological resources and their habitats
- Cost effective contaminated sediment management strategies
- Expanded beneficial use alternatives
- Improved information management
- Successful project management and contracting strategies
- Increase navigation dredging efficiency and production

Dredging Operations Technical Support Program (DOTS)

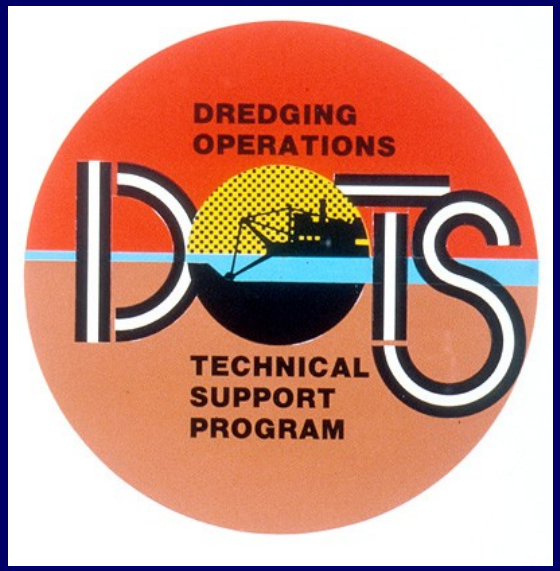


Since 1978

Dr. Doug Clarke

Douglas.G.Clarke@erdc.usace.army

DOTS MISSION AREA



DOTS
FUNCTIONS

- **Technology Transfer**
  - **Direct Technical Support**
  - **Training & Outreach**
  - **Technology Application**

Direct Technical Support

A Response Can……

- **Be initiated by letter or e-mail request**
- **Consist of up to 2 weeks of senior scientist or engineer time & travel**
- **Range from phone calls to on-site assistance**
- **Result in products such as an MFR, technical document, or litigation testimony**

Activities

- **Training**
  - **Dredged Material Assessment and Management Seminar**
    - **San Francisco, 2002**
    - **Denver, 2003**
    - **Cleveland, 2004**
    - **Boston, 2005**

DOTS GOAL

- Provide a gateway to comprehensive, up-to-date resources on all engineering and environmental aspects of navigation
  - Web-based tools
  - Maintain network of key points of contact and resources

Dredging Operations Technical Support Program

U.S. Army Corps of Engineers | Engineer Research & Development Center | Environmental Laboratory

- What's New
- Research
- Databases
- Beneficial Uses of Dredged Material
- Publications
- Guidance Documents
- Models
- Center for Contaminted Sediments
- Expertise/Contacts /Research Teams
- Training
- Dredging Resources
- Education Center
- Related Sites
- ACCORD

Program Manager: Dr. Douglas Clarke
Program Monitor: Mr. Joseph Wilson

The Dredging Operations Technical Support Program, known as DOTS, provides direct environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance (O&M) dredging mission. Technology transfer activities have supported diverse field needs for years and have directly benefited O&M dredging operations throughout the United States.

Take a Trip Through a Dredge!

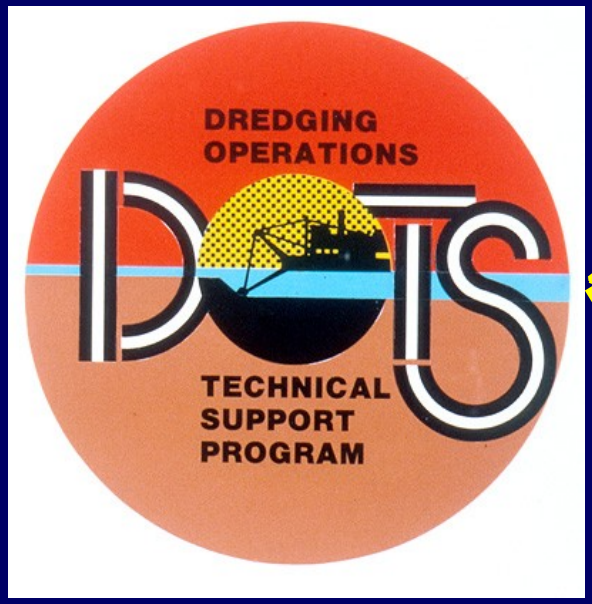
Search

http://el.erdc.usace.army.mil/dots

Research Links

DOER

Dredging Operations and Environmental Research
. . . striking the balance
| U.S. Army Corps of Engineers | Engineer Research and Development Center | Warning |
DOER Focus Areas
Contaminated sediments
Environmental windows
Innovative technologies
Instrumentation
Nearshore/aquatic placement
Risk management
Technology Transfer
Reports
Technical notes
Bulletins
Research briefs
Research Team
Tools
Dredging Calculators and Screening Tools
Animations
CD-ROM, DOER Products Vol. 1
Related WES links
Coastal and Hydraulics Laboratory/Dredging
Environmental Laboratory/ Dredging Operations Technical Support
Point of Contact
Robert M. Engler, Ph.D., Senior Scientist (EL)
William H. McAnally, Ph.D., Technical Director (CHL)
The Dredging Operations and Environmental Research (DOER) Program supports the U.S. Army Corps of Engineers Operation and Maintenance Navigation Program. Research is designed to balance operational and environmental initiatives and to meet complex economic, engineering, and environmental challenges of dredging and disposal in support of the navigation mission. Research results will provide dredging project managers with technology for cost-effective operation, evaluation of risks associated with management alternatives, and environmental compliance.
USACE Program Monitors
• Barry Holliday, Navigation
• Joseph R.Wilson, Navigation
• Charles Chesnutt, Planning
• Michael J. Klosterman, Engineering



DMRP

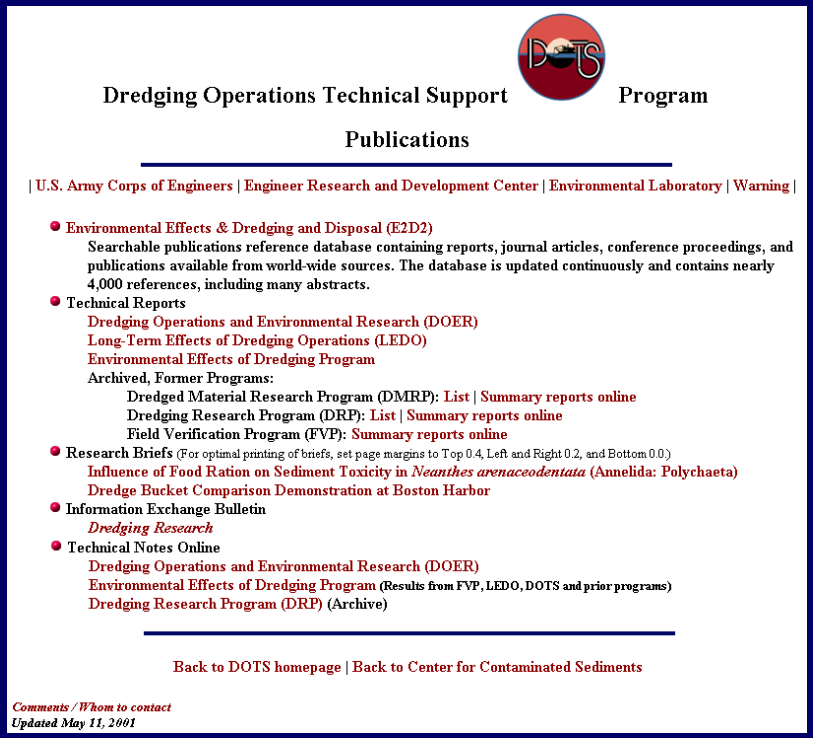
DRP

FVP

LEDO

PUBLICATIONS

- Technical Notes
- Technical Reports
  - DOER – Active
  - DMRP, FVP, LEDO - Archived
- Dredging Research Bulletin
- Research Briefs



Dredging Operations Technical Support Program

Publications

| U.S. Army Corps of Engineers | Engineer Research and Development Center | Environmental Laboratory | Warning |

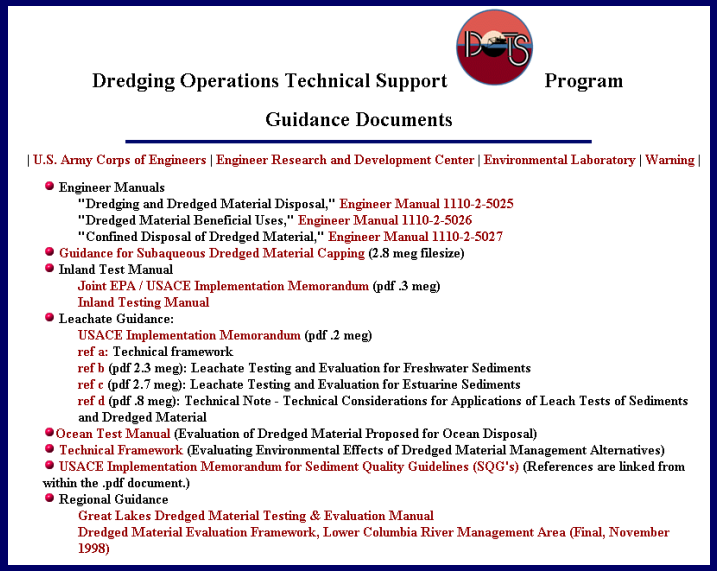
- Environmental Effects & Dredging and Disposal (E2D2)
  Searchable publications reference database containing reports, journal articles, conference proceedings, and publications available from world-wide sources. The database is updated continuously and contains nearly 4,000 references, including many abstracts.
- Technical Reports
  - Dredging Operations and Environmental Research (DOER)
  - Long-Term Effects of Dredging Operations (LEDO)
  - Environmental Effects of Dredging Program
  - Archived, Former Programs:
    - Dredged Material Research Program (DMRP): List | Summary reports online
    - Dredging Research Program (DRP): List | Summary reports online
    - Field Verification Program (FVP): Summary reports online
- Research Briefs (For optimal printing of briefs, set page margins to Top 0.4, Left and Right 0.2, and Bottom 0.0)
  - Influence of Food Ration on Sediment Toxicity in *Neanthes arenaceodentata* (Annelida: Polychaeta)
  - Dredge Bucket Comparison Demonstration at Boston Harbor
- Information Exchange Bulletin
  - *Dredging Research*
- Technical Notes Online
  - Dredging Operations and Environmental Research (DOER)
  - Environmental Effects of Dredging Program (Results from FVP, LEDO, DOTS and prior programs)
  - Dredging Research Program (DRP) (Archive)

Back to DOTS homepage | Back to Center for Contaminated Sediments

Comments / Whom to contact
Updated May 11, 2001

GUIDANCE DOCUMENTS

- Engineer Manuals
- Capping
- Testing Manuals
- Leachate Guidance
- Technical Framework
- Sediment Quality Guidelines

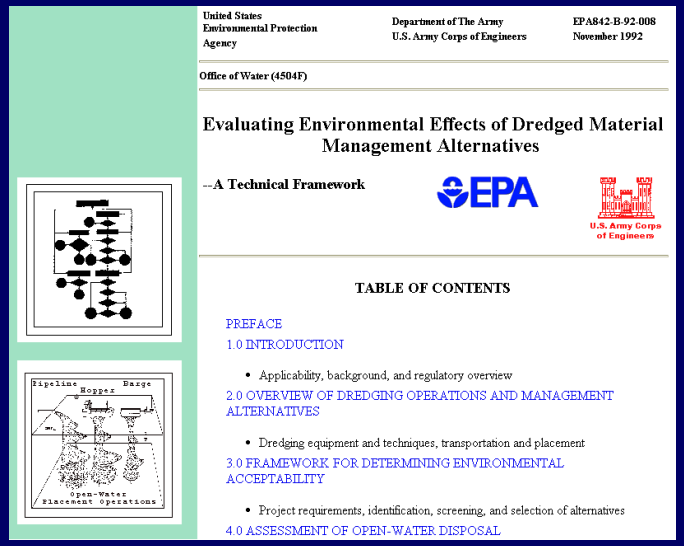


Dredging Operations Technical Support Program

Guidance Documents

| U.S. Army Corps of Engineers | Engineer Research and Development Center | Environmental Laboratory | Warning |

- Engineer Manuals
  - "Dredging and Dredged Material Disposal," Engineer Manual 1110-2-5025
  - "Dredged Material Beneficial Uses," Engineer Manual 1110-2-5026
  - "Confined Disposal of Dredged Material," Engineer Manual 1110-2-5027
- Guidance for Subaqueous Dredged Material Capping (2.8 meg filesize)
- Inland Test Manual
  - Joint EPA / USACE Implementation Memorandum (pdf .3 meg)
  - Inland Testing Manual
- Leachate Guidance:
  - USACE Implementation Memorandum (pdf .2 meg)
  - ref a: Technical framework
  - ref b (pdf 2.3 meg): Leachate Testing and Evaluation for Freshwater Sediments
  - ref c (pdf 2.7 meg): Leachate Testing and Evaluation for Estuarine Sediments
  - ref d (pdf .8 meg): Technical Note - Technical Considerations for Applications of Leach Tests of Sediments and Dredged Material
- Ocean Test Manual (Evaluation of Dredged Material Proposed for Ocean Disposal)
- Technical Framework (Evaluating Environmental Effects of Dredged Material Management Alternatives)
- USACE Implementation Memorandum for Sediment Quality Guidelines (SQG's) (References are linked from within the .pdf document.)
- Regional Guidance
  - Great Lakes Dredged Material Testing & Evaluation Manual
  - Dredged Material Evaluation Framework, Lower Columbia River Management Area (Final, November 1998)



United States Environmental Protection Agency | Department of The Army U.S. Army Corps of Engineers | EPA842-B-92-008 November 1992

Office of Water (4504F)

Evaluating Environmental Effects of Dredged Material Management Alternatives

--A Technical Framework

EPA

U.S. Army Corps of Engineers

TABLE OF CONTENTS

PREFACE
1.0 INTRODUCTION
- Applicability, background, and regulatory overview
2.0 OVERVIEW OF DREDGING OPERATIONS AND MANAGEMENT ALTERNATIVES
- Dredging equipment and techniques, transportation and placement
3.0 FRAMEWORK FOR DETERMINING ENVIRONMENTAL ACCEPTABILITY
- Project requirements, identification, screening, and selection of alternatives
4.0 ASSESSMENT OF OPEN-WATER DISPOSAL

DATABASES

- Environmental Effects & Dredging and Disposal Literature Database (E2-D2)
- Ocean Disposal Database (ODD)
- Biota Sediment Accumulation Factor Database (BSAF)
- Environmental Residue-Effects Database (ERED)
- Upland Dredged Material Environmental Effects Database (UDMEED)
- Sea Turtle Data Warehouse (STDW)

Beneficial Uses of Dredged Material

U.S Army Corps of Engineers | Engineer Research and Development Center | U.S. Environmental Protection Agency

Introduction

Engineered Uses

Environmental Enhancement

Agricultural/ Product Uses

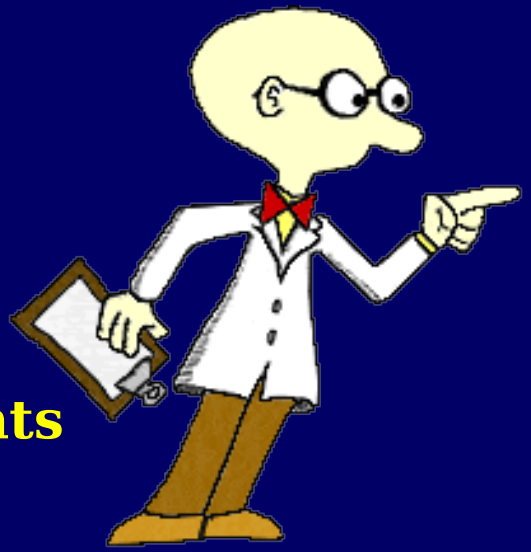
Most dredged material can be a valuable resource and should be considered for beneficial uses. The purpose of this site is to demonstrate potential beneficial uses of dredged material by presenting existing case studies as examples. Category descriptions, procedural outlines, and reference resources are also provided.

This site is a collaborative effort between
U.S. Environmental Protection Agency and U.S. Army Corps of Engineers

Web Educational Outreach

Objectives

- **Promote understanding of navigation and dredging**
- **Create a Corps' classroom connection**



Target Users

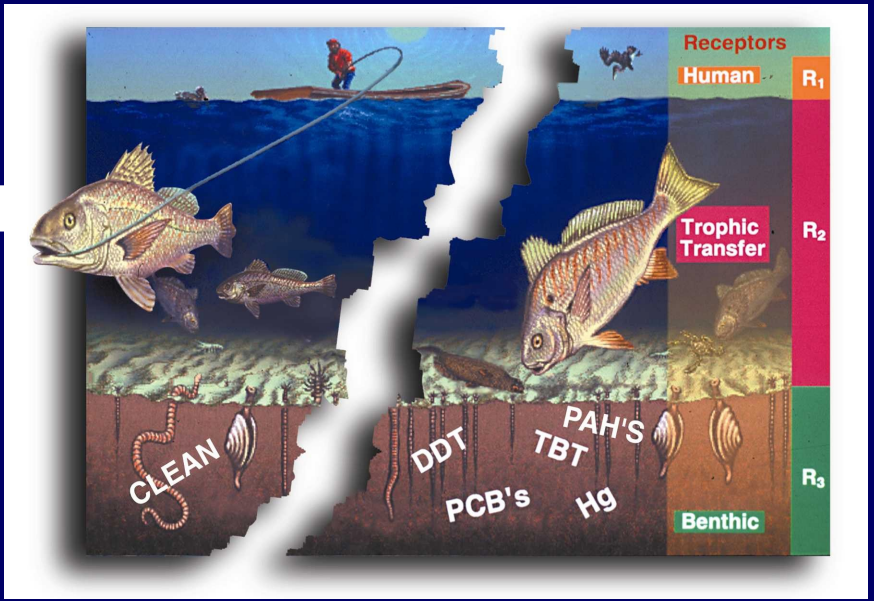
- **K-12+ Students**
- **Teachers**
- **Home Schoolers**
- **Corps**

Site Components

- **Unit lessons**
- **Classroom activities**
- **Demos and Experiments**
- **Interactive quiz games**
- **Young Engineer's Club**
- **Corps and**

DOER and DOTS

- **The power of combining:**
  - **Advanced science and engineering**
  - **Technology transfer**
- **Sensible methods for quantifying risks and uncertainties**



- **Sound and cost efficient engineering technologies for managing risks and uncertainties**
- **Structured and defensible methods for guiding decision making**